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Pesticides and increased food production - a response to Dunn & colleagues

Dear Editor,

The Bayer Crop Science affiliates argue in response to Karunaratne's article that pesticides are integral to efforts to increase food production and avert mass famine, and that pesticide use has become less hazardous overtime. Most would agree that the successes of the Green Revolution are largely due to plant breeding, increases in fertilizer use and more irrigated land [1]. Crop protection is important in preventing losses, but the role of pesticides in this equation is by no means clear. Many studies have shown that crop protection without synthetic pesticides maintains or increases yields at lower cost [2-4].

Their letter misses the point that toxic pesticides cannot be used safely in developing countries where farmers do not use personal protective equipment because it is unaffordable, unavailable and uncomfortable; pesticides are typically stored at home for convenience and because of their value; family and community members are exposed to pesticides because they work in the fields while or soon after pesticides have been applied; and these same pesticides are frequently used as a means of suicide by members of farming communities because they are easily accessible.

It is also inaccurate to imply that the pesticide industry has taken steps to reduce pesticide hazards since the publication of 'Silent Spring.' This book identified the risks of organochlorine insecticides, which remained in widespread use into the 1980s and in some countries beyond. Organochlorines were largely replaced by organophosphates, which are acutely toxic to mammals. Organophosphates were followed by equally toxic carbamates, which were in turn replaced by synthetic pyrethroids, in some cases, also acutely toxic to mammals.

Bacillus thuringiensis (Bt), which is referred to as the replacement for DDT, did not enter widespread use until the 1980s, largely in public health, and was not commercialized in genetically modified crop seeds until the 1990s. While Bt is not toxic to mammals, its various strains are order-specific among insects. Because only a small percentage of any given insect order are agricultural pests [5], Bt, like other insecticides, negatively impacts biodiversity.

Pesticide registration does not require demonstration of the usefulness or contribution to food security of a pesticide, in relation to other available pest control methods: this is generally left to market forces to decide, and the markets are often more strongly influenced by powerful chemical producers than by advocates of zero or low input agriculture.

Precision agriculture, which the correspondents refer to, may be part of the answer, but is inaccessible to the vast majority of farmers around the world, who live in developing countries. It also does nothing to remove highly hazardous chemicals from being readily accessible to farming communities. Only removal of the pesticides that kill people will solve that problem.

We would welcome a 'transdisciplinary dialogue' on this issue with the manufacturers of pesticides. This could be an opportunity to encourage industry activities that would protect and promote global health alongside sustainable food security.

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